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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BERMAN, SUSAN W

ART UNIT	PAPER NUMBER
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1711

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/725,995

Applicant(s)

NAPADENSKY ET AL.

Examiner

Susan W. Berman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-124 is/are pending in the application.
- 4a) Of the above claim(s) 1-79 and 106-124 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 80-105 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 1-124 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Elections/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claim(s) 1-6, drawn to a method for printing a three-dimensional object comprising depositing a material by a three-dimensional printing apparatus, classified in Class 264, subclass 1.1+.
- II. Claim(s) 7-21, drawn to a method for printing a three-dimensional object comprising depositing three different constructions, classified in Class 264, subclass 34.
- III. Claim(s) 22-25, drawn to a method for printing a three-dimensional object comprising depositing a interface material and constructing indicators of a preferable removal instruction, classified in Class 427, subclass 466.
- IV. Claim(s) 26-30, drawn to an object printing method comprising dispensing an interface material to form a casting mold, constructing a grid of modeling material in the support, classified in Class 164, subclass 159+.
- V. Claim(s) 31-35, drawn to an apparatus for printing a three-dimensional object comprising a controller to enable depositing layers of interface materials separated by spaces, classified in Class 700, subclass 119.
- VI. Claim(s) 36-48, drawn to an apparatus for printing a three-dimensional object comprising a controller to enable constructing different support, exterior and release layer constructions, classified in Class 700, subclass 118.
- VII. Claim(s) 49-52, drawn to an apparatus for printing a three-dimensional object comprising a controller to enable constructing an interface layer and indicators indicating instructions for the interface materials, classified in Class 700, subclass 118.
- VIII. Claim(s) 53-57, drawn to an apparatus for printing a three-dimensional object comprising a controller to enable dispensing a plurality of layers of interface material in a pre-determined arrangement, classified in Class 700, subclass 118.

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IX. Claim(s) 58-75, drawn to a pseudo composite material comprising two phases and a multiplicity of construction layers, classified in Class 428, subclass 411.1+.

X. Claim(s) 76-79, drawn to a three dimensional object comprising a pseudo composite material, classified in Class 428, subclass 411.1+.

XI. Claim(s) 80-105, drawn to a method for preparation of a pseudo composite material having a non-homogeneous three-dimensional structure, classified in Class 264, subclass 401.

XII. Claim(s) 106-124, drawn to a three-dimensional printer comprising a controller to enable producing a first phase and a second phase, classified in Class 700, subclass 96.

The inventions are distinct, each from the other because of the following reasons:

Inventions IX and X are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product (MPEP § 806.04(b), 3rd paragraph), and the species are patentably distinct (MPEP § 806.04(h)). In the instant case, the intermediate product is deemed to be useful as a composite material for providing sheets and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Inventions I to IV or XI and V to VIII or XII are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the processes as claimed can

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be practiced by any of the different apparatus set forth in Groups V to VIII or XII or by a materially different stereolithographic apparatus.

Inventions I to IV or XI and IX or X are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the process as claimed can be used to make a product wherein the layers were deposited by a method other than ink jet printing.

Inventions I to IV and XI are related as materially different processes for printing a three-dimensional object. The methods set forth comprise unrelated steps, such as depositing a layer of interface material or depositing a support construction or constructing interface material indicators or forming a casting mold.

Inventions V to VIII and XII are related as materially different apparatus for printing a three-dimensional object. The apparatus in each group has a means plus function limitation with respect to the controller that is considered to be materially different from the others.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper. Because these inventions are distinct for the reasons given above and the search required for each Group is not required for the other Groups, restriction for examination purposes as indicated is proper. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Yuan Min Cai (for Caleb Pollack) on July 28,2005 a provisional election was made with traverse to prosecute the invention of Group XI, claims 80-105.

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Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-79 and 106-124 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

Claims 80-105 are objected to because of the following informalities: In claim 84, the phrase “more than of one” should read “more than one”. In claim 98 “properties are” should read “property is”. The word “un-isotropic should be “anisotropic”. Throughout the claims the word “comprising” should be changed to “comprises” to be grammatically correct. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 80-105 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 80: The “first phase composition” and “first phase” are not clearly differentiated from the “second phase composition” and the “second phase” since each phase or composition is defined only as comprising an organic compound. It is not clear what the composition of the “construction layers” recited in line 9 is. in lines 4 and 7, it is suggested that the phrases “first phase comprising...” and “second phase

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comprising...” be rewritten to read “first phase composition comprises...” and “second phase composition comprises...”. In line 9, it is not clear what is meant by “whereby depositing..layers”. Is the phrase incomplete or does applicant intend to set forth “thereby depositing... layers”? The phrase “thereby depositing... layers” is required to provide antecedent basis for claims 82-85.

Claims 80-82 are confusing with respect to what is meant by “construction layers” in relation to first phase composition, second phase composition, first phase (cured?), and second phase (cured?). It is not clear what step is being added to the steps set forth in claim 80 since claim 80 already recites producing two phases. It is not clear how a “phase” comprises a “multiplicity of construction layers” since in claim 80 each “phase composition” provides a “phase”. Does each “phase” recited in claim 80 provide a “construction layer”? If so, how can each “phase” comprise a “multiplicity of construction layers”? Furthermore, it is not clear what kinds of “construction layers” are intended. With respect to claim 81, it is not clear how each phase can comprise more than one construction layers since, in claim 80, it takes two phases to produce the construction layers. With respect to claim 82, it is not clear how one “construction layer” can comprise both compositions.

In claims 93 and 94, it is not clear what kind of “interface material” is suitably present in the compositions.

With respect to claim 97, there is no antecedent basis in claim 80 for “wherein the properties”. It is suggested that the claim read “wherein said pseudo composite material has a property selected from the groups consisting of isotropic, non-isotropic and combinations thereof”.

With respect to claims 99 and 100, there is no antecedent basis in claim 80 for “the mechanical strength” or for “the elasticity of”.

With respect to claims 101 and 103, the method step set forth is already set forth in claim 80, therefore, this claim does not further limit the method set forth in claim 80.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 80-103 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 00/11092. WO 0011092 discloses a method for selective deposition of a modeling material for producing a three-dimensional article from phase change compositions having improved strength and toughness. Several different compositions are taught, including compositions comprising a base material and plasticizer or reactive monomers or a non-reactive polymeric material or a wax material. The modeling materials disclosed have viscosity properties allowing dispensing from a moveable dispensing unit at elevated temperature to provide a flowable liquid to desired locations. The materials can be cured by heating or UV radiation exposure. WO '092 teaches that the invention can be employed in any selective modeling system wherein a phase change material is applied in successive layers as a liquid and subsequently hardens to produce a three dimensional article. See pages 6-7. Components of compositions corresponding to those set forth in the instant claims are taught in pages 7-16. Tackifying resins disclosed appear to meet the requirement for an interface material in instant claims 93-94 (page 5, paragraph 4, and page 14, last three lines). Properties of some of the disclosed cured compositions are taught on pages 21 and 22. An example of curing is taught in Example 13. See WO '092 claims 13-16.

With respect to claim 80, WO '092 does not specifically mention producing a pseudo composite material having a non-homogeneous three-dimensional structure. However, it is the examiner's position that the method disclosed by WO '092 would inherently produce such a material. The reason is that WO '092 teaches producing a three-dimensional structure from compositions comprising a base material that encapsulates the remaining components and/or compositions comprising components such as a filler or

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wax that would be expected to provide a non-homogeneous material. The features of the dependent claims are also taught in WO '092, as pointed out above.

With respect to claims 83-85, WO '092 is not specific with respect to when curing or solidifying is performed. Example 13 discloses building parts on an "Actura 2100" using normal parameters and that the parts, tack-free and tough enough for routine handling, could be placed in a UV curing apparatus and exposed to UV. WO '092 is considered to disclose at least partial curing or solidifying immediately after deposition and also after deposition of more than one layer in Example 13. The teaching of WO '092 that parts, as built were tack-free and tough enough for handling, is considered to teach claim 85.

With respect to claims 99 and 100, WO '092 does not mention whether the mechanical strength or elasticity of the pseudo composite material is the same or different along one axis compared with another axis in the material. This property is considered to be an inherent property of the method taught by WO '092 since the method steps disclosed correspond to those set forth in the instant claims for providing these properties.

Claims 80-85, 88-94, and 97-105 are rejected under 35 U.S.C. 102(b) as being anticipated by Helinski (5,136,515). Helinski discloses several different embodiments for producing a three dimensional object by jetting at least two different materials into various layers, wherein the second material forms a support for the first material. See columns 2-3. An interface material is considered to be disclosed in column 3, lines 24-35. A composite comprising release layers is considered to be taught in column 3, lines 36-41.

Claims 80-99 and 101-103 are rejected under 35 U.S.C. 102(b) as being anticipated by Cima et al (5,387,380). Cima et al disclose a process comprising depositing a first layer of a powder material and depositing a binder material to selected regions and repeating the steps to form a component. Unbonded

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powder material is then removed. See column 2, line 55, to column 3, line 20, column 4, lines 12-55, column 9, lines 7-50, column 10, lines 58-68, column 11, lines 49-58, and column 13, lines 9-66.

Claims 80-98 and 101-104 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamane et al (5,059,266). Yamane et al disclose a method for forming a three-dimensional article wherein a photosetting or thermosetting material is jetted from ink jet heads to a stage, laminated and exposed to light to cure. See column 6, line 60, to column 8, line 21, column 11, line 4, to column 12, line 37, column 13, lines 58-66.

Claims 80-94, 97-98 and 100-104 are rejected under 35 U.S.C. 102(b) as being anticipated by Napadensky in US 2002/0016386, published 02/07/2002. The instant claims 80-105 have an effective filing date of 12/03/2003. The “phase compositions” set forth in the instant claims are defined in the disclosure as “any composition suitable for building a three-dimensional object”. Napadensky ‘386 discloses a method corresponding to the limitations set forth in the instant claims and compositions to use in the method. See paragraphs [0169] to [0177] and claims 35-63.

Claims 80-105 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,569,373 (Napadensky). US ‘373 issued from the parent application of the instant application. Napadensky ‘373 discloses a method for forming a three-dimensional object wherein a first interface material provides a solid form while the second interface material provides a liquid form. Thus the method disclosed provides a 3-D object meeting the instantly claimed recitation for a pseudo composite having a non-homogeneous three-dimensional structure. Napadensky discloses dispensing an “interface material” and curing. The “phase compositions” set forth in the instant claims are defined in the instant disclosure as “any composition suitable for building a three-dimensional object”, thus the interface materials set forth in

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'373 correspond to the instantly claimed "phase compositions". The features of the instant dependent claims, as written, are also disclosed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 80-105 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 35-63 of copending Application No. 09/797869 (Napadensky prepub US 2002/0016386). Although the conflicting claims are not identical, they are not patentably distinct from each other for the following reasons. The differences between the instant claims and the claims of '869 are that the instant claims recite: (1) a pseudo composite having a three-dimensional structure" and (2) dispensing a "phase composition" while the claims of '869 recite: (1) a "3-D object" and (2) dispensing an "interface composition". The "phase compositions" set forth in the instant

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claims are defined in the instant disclosure as “any composition suitable for building a three-dimensional object”, thus the interface compositions set forth in ‘869 correspond to the instantly claimed “phase compositions”. The “pseudo composite having a three-dimensional structure” in the instant claims corresponds to the “3-D object” in the claims of ‘869. Claims 57-63 of ‘869 set forth the curing step, modulus of elasticity, support layers and release layers set forth in the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 80-105 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-7 and 17-20 of copending Application No. 10/724399 (Gothait et al in US 2005/0069784). Although the conflicting claims are not identical, they are not patentably distinct from each other for the following reasons. The differences between the instant claims and the claims of ‘399 are that the instant claims recite: (1) a pseudo composite having a three-dimensional structure” and (2) dispensing a “phase composition” while the claims of ‘399 recite: (1) a “three-dimensional model” and (2) dispensing an “interface material”. The “phase compositions” set forth in the instant claims are defined in the instant disclosure as “any composition suitable for building a three-dimensional object”, thus the interface materials set forth in ‘399 correspond to the instantly claimed “phase compositions”. The “pseudo composite having a three-dimensional structure” in the instant claims corresponds to the “three-dimensional model” in the claims of ‘399.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 80-105 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-42 of U.S. Patent No. US 6,569,373 (Napadensky).

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Although the conflicting claims are not identical, they are not patentably distinct from each other for the following reasons. This patent issued from the parent application of the instant application but the instant claims were not restricted from the parent application. The differences between the instant claims and the claims of '373 are that the instant claims recite: (1) a pseudo composite having a non-homogeneous three-dimensional structure" and (2) dispensing a "phase composition" while the claims of '373 recite: (1) a "three-dimensional object" and (2) dispensing an "interface material". The "phase compositions" set forth in the instant claims are defined in the instant disclosure as "any composition suitable for building a three-dimensional object", thus the interface materials set forth in '373 correspond to the instantly claimed "phase compositions". The "pseudo composite having a three-dimensional structure" in the instant claims corresponds to the "three-dimensional object" in the claims of '373. It would have been obvious to one skilled in the art at the time of the invention to produce a non-homogeneous three dimensional structure by the method set forth in the claims of US '373 because the method employs two different materials that would be expected to form a non-homogeneous object. Claim 1 of US '373 recites that the first interface material provides a solid form while the second interface material provides a liquid form.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 4,942,060 (Grossa), US 5,192,559 (Hull et al), US 6,635,412 (Afromowitz), and US 5,002,854 (Fan et al).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan W Berman whose telephone number is 571 272 1067. The examiner can normally be reached on M-F 9:30-6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571 272 1078. The fax phone number for the organization where this application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SB
8/7/2005



Susan W Berman
Primary Examiner
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